2 Sheets—Sheet 1.

C. T. BROWN.

Type-Writing Machine.

No. 217,444. Patented July 15, 1879.

Fig. 1.

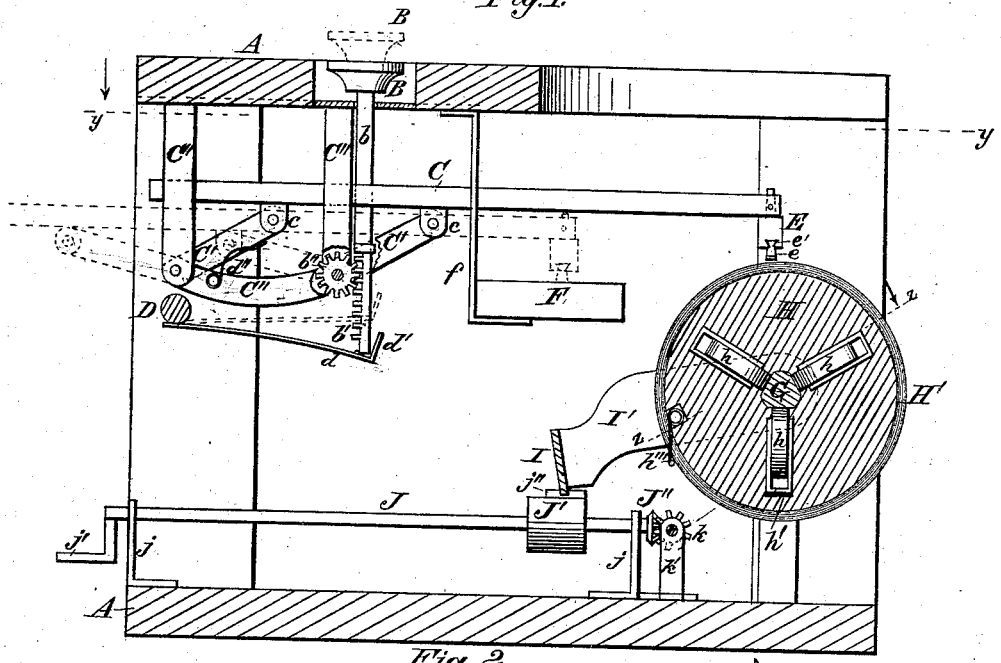
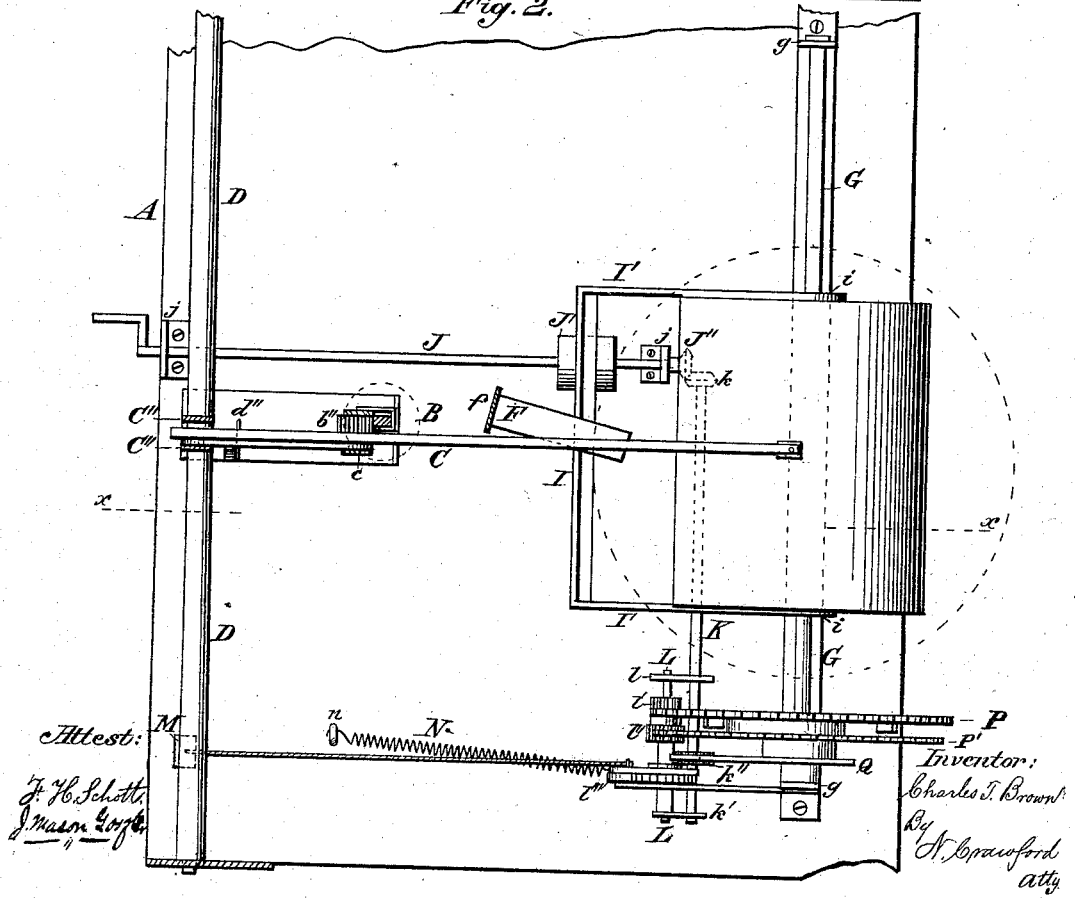


Fig. 2.



Attest:

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C. T. BROWN.
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Fig. 3.

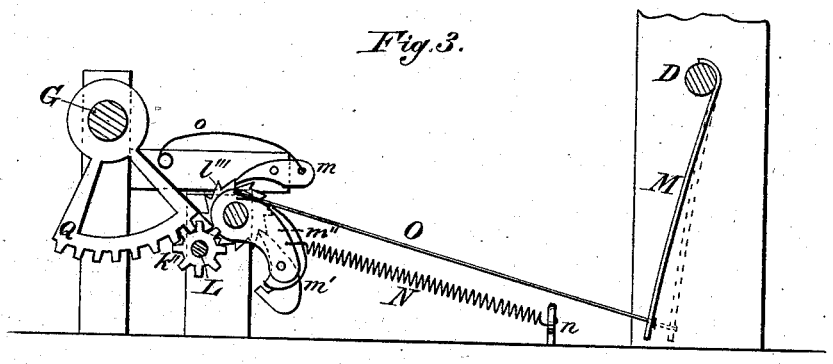


Fig. 4.

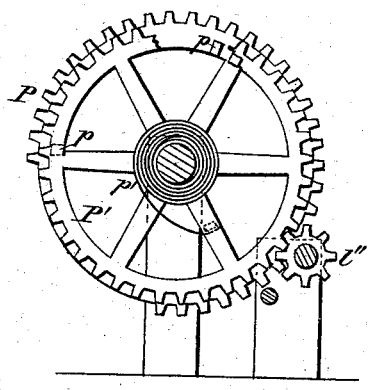


Fig. 5.

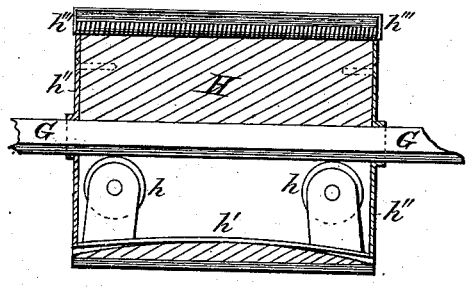


Fig. 7.

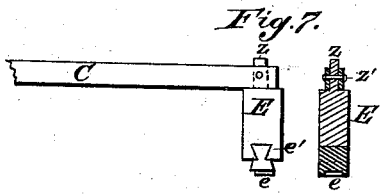
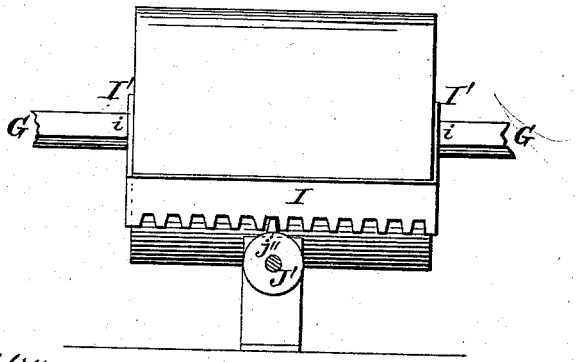


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES T. BROWN, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN TYPE-WRITING MACHINES.

Specification forming part of Letters Patent No. **217,444**, dated July 15, 1879; application filed April 7, 1879.

To all whom it may concern:

Be it known that I, CHARLES T. BROWN, of Chicago, in the county of Cook and State of Illinois, have made certain Improvements in Machines known as Type-Writers, of which the following is a specification.

The invention consists in the construction and arrangement of the actuating parts of the machine, as will be fully hereinafter described.

In the drawings, Figure 1 is a transverse sectional view on line *x x* of Fig. 2. Fig. 2 is a top view of machine on line *y y* of Fig. 1. Figs. 3 and 4 are side views of actuating parts. Fig. 5 is a longitudinal sectional view of paper-holding cylinder and shaft. Fig. 6 is a view of a rack and one-toothed pinion to move the cylinder on shaft, and Fig. 7 shows the construction of type-hammer head and type therein.

A represents the case in which the machine is secured. B represents one of any required number of keys by which the type or letters are caused to print on the paper, and rises above the cover of case A. *b* is the key-spindle, fast to the under side of key B, and extends down to a proper distance and rests upon a spring-arm, and has rack-teeth *b'* on one side of and at its lower end to gear into a pinion, *b''*. This spindle reciprocates freely perpendicularly in proper guides, that keep it in position and in gear with the pinion *b''* at all times.

C is the type lever or arm that carries the type-head and type that prints a letter. *c c* are two pairs of ears on the under side of the lever C at proper points. C' C' are arms pivoted to and between the ears *c* on lever C at their upper ends, and at their lower ends to a framing, C'', that is fast to top of case, and composed of two pairs of uprights, between which the arms C' freely work, or perform a circular movement, and a base-bar between the uprights to hold them at their lower ends the proper distance apart.

D is a horizontal longitudinal rock-shaft, about midway of the height of case A on its rear side, and is journaled at each end to the case to freely rock or partially rotate. *d* is a spring-arm made fast to the rock-shaft D, and extends inward toward the center of the machine far enough to receive the lower end of the key-spindle *b*, and has at its inner end a lip, *d'*, turned up to keep the lower end of the key-spindle from sliding off of the end of the spring-arm.

d'' is a spring attached to frame C'', and bent to receive the rear arm, C', and makes the blow of the type upon the paper elastic, and after the type has made its impression helps to remove it out of contact with the paper.

E is the wooden type-head that holds the type *e* in its lower face, and is firmly attached to the end of type-lever C by a tenon, *z*, on its upper end, which fits into a mortise through the end of lever C, and is secured therein by a transverse pin, *z'*, or other equivalent fastening. Type *e* is cast india-rubber, the upper end of which enters into a dovetail groove, *e'*.

F is an inking-pad, made of porous material and covered with a fibrous covering. This inking-pad may be continuous, so as to receive all the type of the series, or it may be divided into as many parts as there are type and figures to be inked, or into sections, so that a number of type may be inked thereon, as may be most convenient, and it is suspended from the under side of the case by bracket *f*, which can be adjusted so as to ink several of a series of type.

G is a horizontal shaft, triangular in form, and is journaled in bearings *g g* at its ends, and freely rotates therein.

H is the cylinder upon which the paper, H', to be printed upon is placed and held, and shaft G passes longitudinally through it, and upon which shaft it can freely slide longitudinally.

h h h are three friction-rollers placed in each end of the cylinder, in such manner as that all of the rollers at each end will bear upon the triangular face of shaft G, as seen in Fig. 1. One of the rollers *h*, at each end of cylinder H, has a bearing-spring, *h'*, to act upon its frame to force the roller against shaft G and hold the cylinder centrally upon the shaft, and yet allow it to freely slide longitudinally upon it, as seen in Fig. 5.

h'' h'' are metal heads secured to ends of cylinder H, to keep the friction-pulleys and spring in place.

H' is a sheet of paper placed around the

printing-cylinder H, to be printed upon, and is held in place by the spring-wire clamp *h'''*.

I is a horizontal rack-bar placed forward of the cylinder H, and parallel with the face of, and a little longer than, said cylinder, and at each end of which is an arm, I', which arms pass each end of the cylinder, and have holes *i* in their ends, through which holes shaft G goes, and can freely revolve therein, while the arms hang and turn on flanges of the metal heads *h''* *h''*.

J is a transverse horizontal shaft, journaled in upright bearings *j* *j*, so as to freely revolve therein, with crank *j'* at its outer end to revolve it.

J' is a hub fast upon shaft J, upon which the rack-bar I rests, and has a single tooth, *j''*, projecting from its perimeter, which tooth gears into the teeth of rack-bar I when shaft J is revolved, and moves the rack-bar, and with it the cylinder H on shaft G.

On the inner end of shaft J is a bevel-gear wheel, J'', that gears into its mate gear-wheel *k* on shaft K, which is journaled to revolve in bearings *k'*, and near to its opposite end from wheel *k* is a pinion-wheel, *k''*, which revolves with shaft K.

L is a short horizontal shaft revolving in bearings in upright supports *l* *l*, and has secured therein toothed pinions *l'* and *l''* and ratchet-wheel *l'''*.

m is a spring-pawl taking into the teeth of ratchet-wheel *l'''*.

m' is a spring-pawl that also takes hold of the teeth in ratchet-wheel *l'''*, to turn it the distance of a tooth or more.

M is a spring-arm firmly attached to rock-shaft D, and extends downward to near the bottom of case A.

N is a spiral spring attached to a pivoted plate, *m''*, and that to pawl *m* at one end, and the other to stud *n*.

O is a rod, one end attached to spring-arm M, and the other to plate *m''*.

o is a spring bearing upon pawl *m*, to hold it in contact with the teeth on ratchet-wheel *l'''*.

P is a spur-toothed wheel fast on shaft G, with sixty teeth and a blank space equal to fifteen teeth on its circumference, and gears into an eight-toothed pinion, *l'*, on shaft L; and as it revolves with the pinion while the sixty teeth are in gear, when the blank space of the fifteen teeth comes, the wheel passes by the pinion without moving it. On the side of the rim of wheel P are three projecting lugs or stops, *p*.

P' is another spur-toothed wheel on a loose hub around the shaft G, and has seventy-five teeth on its circumference, that gear into a ten-toothed pinion, *l''*, on shaft L.

Wheel P' has a projecting lug or stop on the side of rim next to wheel P.

p' is a coiled spring, one end attached to shaft G, and the other to the arm of wheel P'.

Q is a sector or quarter spur-wheel, firmly fixed to and revolving with shaft G, and has on its circumference twelve teeth, that gear into pinion *k''* on shaft K.

Operation: By depressing key B, (of which there are as many as desired for letters, figures, and points up to seventy,) the rack-teeth gearing into the pinion causes the arms to force the type-lever carrying the type from over the inking-pad forward and down upon the paper that is clamped upon cylinder H, and a letter is printed upon the paper. This depression of the key also forces down the spring-arm attached to a rock-shaft, the partial rotation of which vibrates another arm projecting down from it to connect with the dogs that rotate a shaft that has pinions upon it to gear into and turn wheels upon the cylinder-shaft that holds the paper. The releasing the key brings the type-bar back to its normal position, and the type to strike upon the inking-pad and be ready for another impression; also, by means of the springs acting upon the dogs or pawls, the ratchet-wheel is partially revolved with its pinions, causing wheels P and P' to make partial and unequal proportions of a revolution by reason of the difference in the number of teeth in pinions, and in such partial revolution winds up the coiled spring attached to wheel P'. As wheel P' completes an entire revolution, wheel P and cylinder H will lack one-fifth, or fifteen teeth, of an entire revolution, and at the instant that wheel P' has completed its revolution wheel P is out of gear with its pinion, and it is made to complete its revolution by the force of the coiled spring carrying with it the cylinder H. Sector-wheel Q, at the instant wheel P is out of gear with its pinion, meshes into gear with pinion *k''* on shaft K, causing pinion *k''* to perform one revolution, and revolving gear-wheels *k* and J'' and hub J', causing its one tooth to gear into and move rack I and cylinder H longitudinally on shaft G, thus making the movement of cylinder H automatic in turning with its shaft, and moving longitudinally upon it when a full line is printed or written. When a broken line is to be printed the cylinder H is caused to slide on shaft G by turning the crank *j'* one revolution, which gives the next line to print upon.

Having thus described my invention, what I claim is—

1. In a type-writer, the combination of the key B, its rack-spindle *b* *b'*, pinion *b''*, arms C' C', lever C, and type-head E, carrying type *e*, with the paper-cylinder H, as and for the purposes described.

2. The combination of the key B, spring-arm *d*, rock-shaft D, arm M, train of gear-wheels *l''* *l'* P P', and intermediate actuating devices with the cylinder H, as and for the purposes described.

3. The combination of the key B, spring-arm *d*, rock-shaft D, arm M, train of gear-

wheels l'' l' P P′ Q k'' k J″ J′, and their intermediate devices with the rack I and cylinder H, as and for the purposes described.

4. The crank-shaft J, one-toothed wheel J′, and rack I, in combination with the cylinder H, constructed and operating as described.

5. The combination, in a type-writer, of the longitudinal sliding paper-holding cylinder H, having therein friction-rollers h, actuated by spring h', and the triangular shaft G, constructed and operating as described.

CHARLES T. BROWN.

Witnesses:
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MELBOURNE H. FORD.